
GALLARDO & ASSOCIATES, INC.

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Environmental and Geological Services

We solve the problem!

June 1, 2006

Ms. Minnie Corbit
4675 Dywalt Road
Sebastopol, CA 95472
(707) 823-4574

Job No. 016A.98

**Subject: TANK REMOVAL REPORT FOR THE MINNIE CORBIT SITE
LOCATED AT: 3880 Gravenstein Highway in Sebastopol, California.**

Dear Ms. Corbit:

Gallardo & Associates, Inc. is pleased to submit the following tank removal report for the following location: **185 Healdsburg Avenue in Healdsburg, California.**

Tank wall and tank bottom conformation soil samples along with one groundwater “***grab***” sample were collected during the removal of one, 500-gallon underground fuel storage tank, (UST). The tank was removed on December 22, 1998. The UST was removed by Steve Chain Environmental, a Certified environmental contractor. The following report addresses the actions taken during the tank removal.

Gallardo & Associates, Inc. understands that you will forward a copy of this report to the Sonoma County Department of Health Services Environmental Health Division (**SCDHSEHD**) for their review. Please call me, if you have any questions at (916) 358-3719.

Respectfully,

Gallardo & Associates, Inc.

Rafael Gallardo
President/Project Geologist

GALLARDO & ASSOCIATES, INC.

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**TANK REMOVAL REPORT
for
THE MINNIE CORBIT SITE
3880 GRAVENSTEIN HIGHWAY IN SEBASTOPOL, CALIFORNIA.**

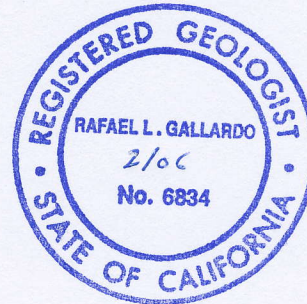
PREPARED FOR:

**Ms. Minnie Corbit, Owner
4675 Dywalt Road
Sebastopol, California 95472**

SUBMITTED TO:

**Ms. Peggy Carr
Sonoma County Department of Health Services
Environmental Health Division
475 Aviation Blvd., Suite 220
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**PREPARED BY:
Rafael L. Gallardo**




Rafael L. Gallardo, President/Geologist, R. G. No. 6834

GALLARDO & ASSOCIATES, INC. PROJECT NO. 016.98

June 1, 2006

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1.0 INTRODUCTION

Site Location and Description

The site is located at 3880 Gravenstein Highway in Sebastopol, California (See **Figure 1**). The property is bordered by Gravenstein Highway to the north, Hessel Road to the west, a commercial property to the east, and other properties to the south. The site property is owned by Ms. Minnie Corbit who, during the tank removal, was leasing the building to a restaurant and bar equipment company called Dolce Neve. The site is presently occupied by her son who runs a Motorcycle repair and custom truck racks shop. The site area slopes gently to the southwest and is covered by gravel, natural ground, and concrete. The regional topography consists of rolling hills and farm land (See **Figure 2**).

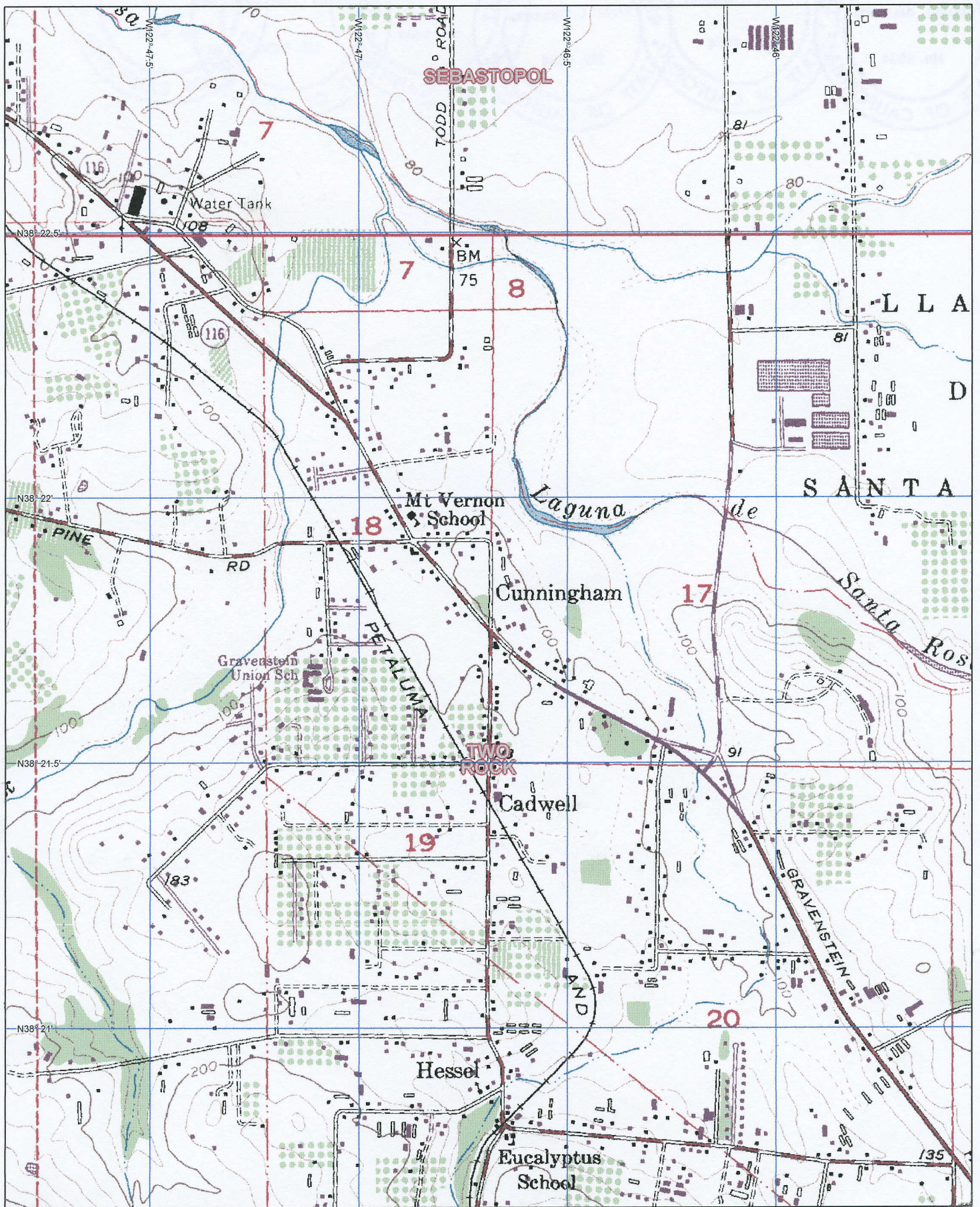
Previous Work and Site Condition

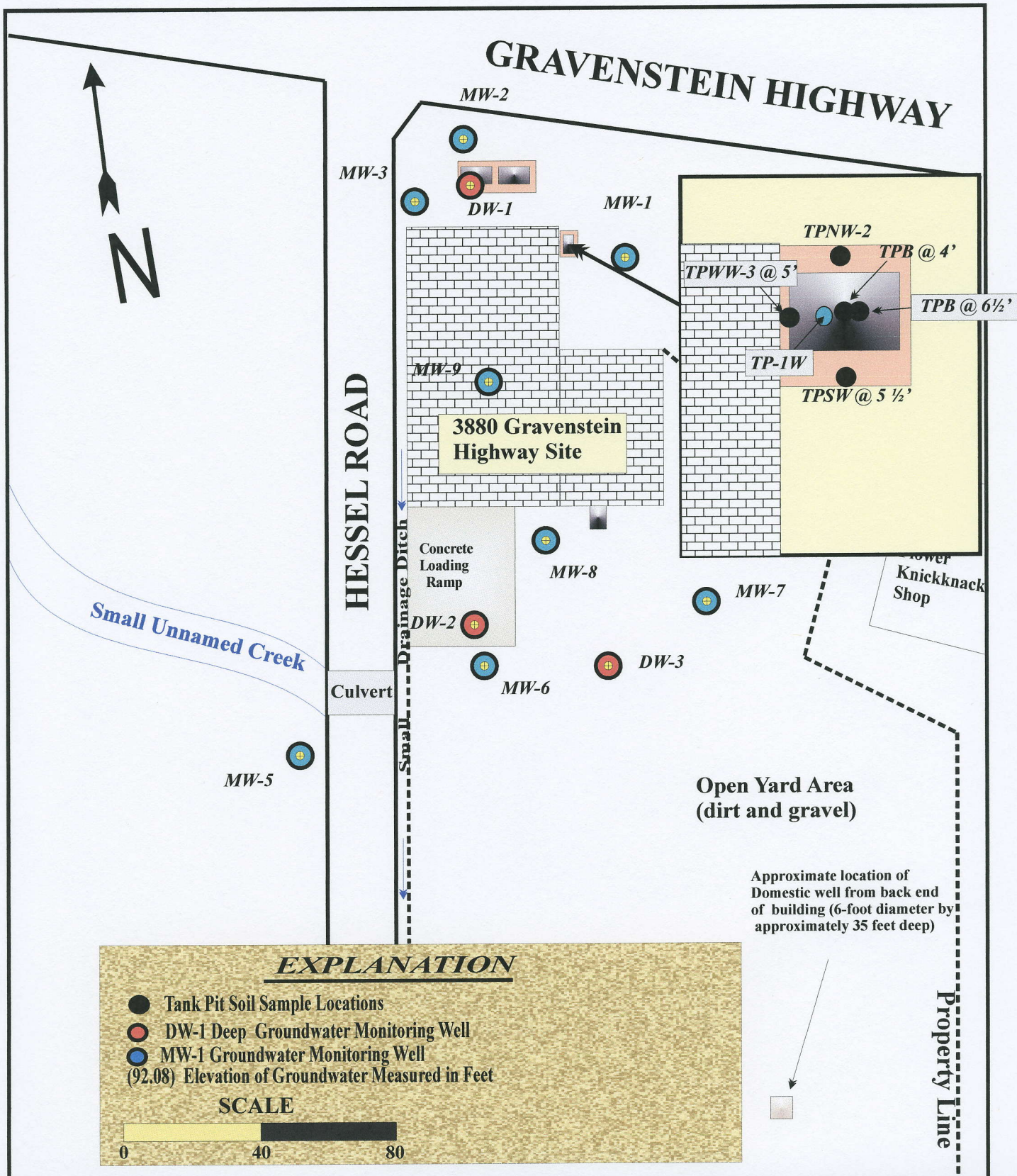
The project site was formally a garage and auto dismantling yard call ***Corbit's Garage and Wrecking Yard***. In July 1990, two 550-gallon steel underground gasoline storage tanks (UST's) were removed from the property. According to PES Environmental, Inc. (PES) of Novato, California the UST's were reportedly used to dispense gasoline for a service station which operated at the site from approximately 1935 to 1980. Holes were observed in each UST during removal and soil observed within the UST's cavity was noted to be "discolored and odorous". Laboratory results of soil samples collected from the tank cavity revealed petroleum hydrocarbons (concentration amounts unknown). The excavation was backfilled and no further work was performed at the site.

In 1993, PES was retained by Ms. Corbit to perform a soil and groundwater investigation at the assessment site. Ms. Corbit informed PES that a third UST might be buried adjacent to the northeast corner of the building. However, PES did not include a search for the third UST as part of their investigation.

On August 27, 1993, the Sonoma County Department of Health Services Environmental Health Division (SCDHSEHD) received a report entitled ***Soil and Groundwater Investigation 3880 Gravenstein Highway South Sebastopol, California***, by PES and dated August 25, 1993. The investigation included the drilling of five soil borings to depths between 25 and 35 feet below grade surface (bgs). Three of the soil borings were converted into two-inch diameter groundwater monitoring wells of various depths (MW-1 to 35 feet bgs, MW-2 to 25 feet bgs, and MW-3 to 25 feet bgs). In their report PES presented soil results from their investigation revealing concentrations of total petroleum hydrocarbons as TPH-g ranging between < 1 parts per million (ppm) to 80 ppm, and the fuel constituent Benzene ranging between < 0.005 ppm to 0.35 ppm. Tables presenting groundwater sampling results revealed TPH-g concentrations ranging between 50 parts per billion (ppb) to 2,400 ppb, and Benzene concentrations ranging between < 0.5 ppb to 140 ppb in the groundwater samples beneath the site. PES recommended: the removal of hydrocarbon-affected soil from the site, and an additional investigation to evaluate the lateral extent of the impacted groundwater beneath the property.

In January 1998, ***Gallardo & Associates*** was retained by Ms. Corbit, the owner of the property, to perform one round of groundwater sampling of the three existing groundwater monitoring wells.





GALLARDO & ASSOCIATES, INC.
Environmental and Geological Services

FORMER TANK PIT LOCATION MAP
Project No. 016.98

FIGURE

2

On January 8, 1998, *Gallardo & Associates* collected groundwater samples from wells MW-1, MW-2, and MW-3. The analytical results for wells MW-1, MW-2, and MW-3 indicated an increasing trend in TPH-g and Benzene concentrations, and a decrease in DCA concentrations for well MW-3, while a decreasing trend in TPH-g and Benzene concentrations was noticed for wells MW-1 and MW-2 since the July 1993 sampling event. Based on the January 1998 groundwater measurements and laboratory results, *Gallardo & Associates* concluded that the groundwater beneath the property was impacted and appeared to be migrating to the southwest towards Hessel Road. *Gallardo & Associates* recommended additional episodes of quarterly groundwater sampling of the three monitoring wells to evaluate trends in gasoline hydrocarbon concentrations in the groundwater and to evaluate trends in the direction of groundwater flow beneath the site. *Gallardo & Associates* additionally recommended additional borings and groundwater monitoring wells to evaluate the lateral and vertical extent of the impacted soil and groundwater beneath the property. A Sensitive Receptor Survey (SRS) was also recommended to evaluate risk to human health and the environment from petroleum fuel hydrocarbons. On January 30, 1998, *Gallardo & Associates* submitted a report entitled *1998 First Quarter Groundwater Sampling Results*.

On April 15, 1998, *Gallardo & Associates* submitted a report entitled *Workplan for a Limited Soil and Groundwater Investigation* to SCEHD for review and approval. The workplan proposed to install four (4) groundwater monitoring wells (two onsite and two offsite) at the site and perform a SRS. The workplan was approved by Eleanor Ratliff of the SCEHD, in a letter dated May 1, 1998.

On October 19, 1998, *Gallardo & Associates* observed the installation of four two-inch diameter groundwater monitoring wells (MW-4, MW-5, MW-6, and MW-7). The wells were developed, purged, and sampled. A well installation report is pending.

In December 1998, *Gallardo & Associates* observed the removal of one 500-gallon underground diesel fuel tank from the site property.

On June 23, 1999, *Gallardo & Associates, Inc.* collected groundwater samples from seven monitoring wells. *Gallardo & Associates, Inc.* concluded that wells MW-1 through MW-7 revealed a decreasing trend for analytes tested that quarter; however, well MW-3 revealed a slight increase in benzene and well MW-5 revealed a trace of TBA at 30 ppb. The groundwater depression observed in the October 1998 monitoring report revealed a southeast directional flow, (nose facing northwest) whereas the June 1999 depression revealed an east directional flow (nose facing east). *Gallardo & Associates, Inc.* recommended continued monitoring of the seven monitoring wells to evaluate trends in the direction of groundwater flow beneath the site and performing a Sensitive Receptor Survey (SRS). *Gallardo & Associates, Inc.* submitted a report entitled *1999 Second Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California, dated July 30, 1999*.

On June 28, 2000, *Gallardo & Associates, Inc.* collected groundwater samples from seven monitoring wells. *Gallardo & Associates, Inc.* concluded that Comparisons of past and current analytical results for wells MW-1 through MW-7 indicated a decreasing trend in petroleum fuel hydrocarbons; however, well MW-3 revealed a slight increase in TPH-g and a slight decrease in benzene. Well MW-6 revealed a trace of 1,2 DCA at 1.3 ppb. In addition, well MW-3 revealed an increase in TBA at 140 ppb. The groundwater depression observed in both the October 1998 and June 1999 monitoring reports revealed a southeast directional flow, (nose facing northwest) and an

east directional flow (nose facing east), respectively. However, the June 2000 groundwater flow direction revealed a southwest directional flow. *Gallardo & Associates, Inc.* recommended continued monitoring of the seven monitoring wells to evaluate trends in the direction of groundwater flow beneath the site and performing a Sensitive Receptor Survey (SRS). *Gallardo & Associates, Inc.* submitted a report entitled *2000 Second Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California, dated October 20, 2000.*

On September 20, 2000 *Gallardo & Associates, Inc.* collected groundwater samples from seven monitoring wells. *Gallardo & Associates, Inc.* concluded that comparisons of past and current analytical results for wells MW-1 through MW-7 indicated a decreasing trend in petroleum fuel hydrocarbons; however, well MW-3 revealed an increase of 1,2 DCA at 14 ppb, while well MW-6 revealed a slight decrease of 1,2 DCA at 1.2 ppb. Groundwater flow for the period was to the southwest with the nose of the depression trending northeast *Gallardo & Associates, Inc.* recommended the following: additional episodes of quarterly groundwater sampling of the seven monitoring wells to evaluate trends in gasoline hydrocarbon concentrations in the groundwater beneath the site; completion of the Sensitive Receptor Survey (SRS); drilling of additional groundwater monitoring wells adjacent to the concrete building pad and building, and one between the existing domestic well and MW-6, and one within the building; and sampling of the domestic well, if possible. *Gallardo & Associates, Inc.* submitted a report entitled *2000 Third Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California, dated October 28, 2000.*

On December 7, 2000, *Gallardo & Associates, Inc.* collected groundwater samples from seven monitoring wells. *Gallardo & Associates, Inc.* concluded that comparisons of past and current analytical results for wells MW-1 through MW-7 revealed no change in the concentration amounts of petroleum fuel hydrocarbons in the groundwater for the quarter; however, wells MW-2 and MW-3 revealed increasing concentrations of TBA, TPH-g, and BTEX. TBA was detected for the first time in well MW-2. The groundwater depression observed during the period matched the October 1998 sampling event, both revealed a southeast directional flow, (nose facing northwest). *Gallardo & Associates, Inc.* recommended the following: additional episodes of quarterly groundwater sampling of the seven monitoring wells to evaluate trends in gasoline hydrocarbon concentrations in the groundwater beneath the site; completion of the Sensitive Receptor Survey (SRS); drilling of additional groundwater monitoring wells adjacent to the concrete building pad and building, and one between the existing domestic well and MW-6, and one within the building; and sampling of the domestic well, if possible. *Gallardo & Associates, Inc.* submitted a report entitled *2000 Fourth Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California, dated March 20, 2001.*

On March 27, 2001, *Gallardo & Associates, Inc.* collected groundwater samples from seven monitoring wells. *Gallardo & Associates, Inc.* concluded that comparisons of past and current analytical results for wells MW-1 through MW-7 revealed no change in the concentration amounts of petroleum fuel hydrocarbons in the groundwater for the quarter; however, well MW-2 revealed a slight increase in toluene at 0.80 ppb, and well MW-3 revealed an increase in benzene at 30 ppb. The groundwater for the March sampling event revealed a south-southwest general flow direction. *Gallardo & Associates, Inc.* recommended the following: additional episodes of quarterly groundwater sampling of the seven monitoring wells to evaluate trends in gasoline hydrocarbon

concentrations in the groundwater beneath the site; completion of the Sensitive Receptor Survey (SRS); drilling of additional groundwater monitoring wells adjacent to the concrete building pad and building, and one between the existing domestic well and MW-6, and one within the building; and sampling of the domestic well, if possible. *Gallardo & Associates, Inc.* submitted a report entitled ***2001 First Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California***, dated May 28, 2001.

On June 7, 2001, *Gallardo & Associates, Inc.* collected groundwater samples from seven monitoring wells. *Gallardo & Associates, Inc.* concluded that comparisons of past and current analytical results for wells MW-1 through MW-7 revealed no change in the concentration amounts of petroleum fuel hydrocarbons in the groundwater for the quarter; however, well MW-2 revealed a slight increase in benzene at 5.6 ppb, and well MW-3 revealed an increase in TPH-g at 4,000, benzene at 210 ppb, and TEX. The groundwater flow for the period revealed a south-southwest general flow direction. *Gallardo & Associates, Inc.* recommended the following: additional episodes of quarterly groundwater sampling of the seven monitoring wells to evaluate trends in gasoline hydrocarbon concentrations in the groundwater beneath the site; completion of the Sensitive Receptor Survey (SRS); drilling of additional groundwater monitoring wells adjacent to the concrete building pad and building, and one between the existing domestic well and MW-6, and one within the building; and sampling of the domestic well, if possible. *Gallardo & Associates, Inc.* submitted a report entitled ***2001 Second Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California***, dated May 28, 2001.

On September 14, 2001, *Gallardo & Associates, Inc.* collected groundwater samples from seven monitoring wells. *Gallardo & Associates, Inc.* concluded that comparisons of past and current analytical results for wells MW-1 through MW-7 revealed a change in the concentration amounts of petroleum fuel hydrocarbons in the groundwater for the quarter in the following wells: MW-2 revealed an increase in TPH-g and Benzene, while MW-3 revealed a dramatic decrease in TPH-g concentrations (from 4,000 ppb down to 650 ppb) and a decrease in benzene concentrations (from 210 ppb down to 150 ppb). The groundwater for the third quarter period revealed a southwest general flow direction. *Gallardo & Associates, Inc.* recommended additional episodes of quarterly groundwater sampling of the seven monitoring wells, additional groundwater monitoring wells (one adjacent to the concrete building pad and building, one between the existing domestic well and MW-6, and one within the building), and sampling of the domestic well, if possible. *Gallardo & Associates, Inc.* submitted a report entitled ***2001 Third Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California***, dated September 17, 2001.

On November 19, 2001, *Gallardo & Associates, Inc.* collected groundwater samples from seven monitoring wells. *Gallardo & Associates, Inc.* concluded that the past and current analytical results for wells MW-1, MW-4, MW-5, MW-6 and MW-7 revealed a change in the concentration amounts of petroleum fuel hydrocarbons in the groundwater for the quarter in the following wells: MW-2 revealed a decrease in TPH-g and Benzene, while MW-3 revealed an increase in TPH-g concentrations (from 650 ppb up to 8,800 ppb), benzene concentrations (from 150 ppb up to 170 ppb), and TBA concentrations from ND up to 62 ppb. The groundwater reversed direction from a southwest flow to a southeast general flow direction. It was thought that impacted soil remained beneath the site property adjacent to well MW-3. Delineation and removal of the impacted soil was proposed in order to reduce the impact to the groundwater. *Gallardo & Associates, Inc.*

recommended additional episodes of quarterly groundwater sampling of the seven monitoring wells and the installation of additional groundwater monitoring wells: one adjacent to the concrete building pad and building, one between the existing domestic well and MW-6, and one within the building, downgradient of well MW-3. Also, additional exploratory soil borings to evaluate the extent of the underlying impacted soil beneath and around well MW-3. And finally, sampling of the domestic well, if possible. *Gallardo & Associates, Inc.* submitted a report entitled **2001 Fourth Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California**, dated November 29, 2001.

On March 13, 2002, *Gallardo & Associates, Inc.* collected groundwater samples from nine monitoring wells. *Gallardo & Associates, Inc.* concluded that the current analytical results for wells MW-1, through MW-9 revealed no significant changes in the concentration amounts of petroleum fuel hydrocarbons in the groundwater for the quarter with the exception of well MW-3, which revealed a dramatic decrease in the TPH-g and Benzene concentrations within the monitoring well. However, there was an increase in the concentration amount of TBA. This was likely due to the recent change in the screening interval for MW-3. *Gallardo & Associates, Inc.* recommended additional episodes of quarterly groundwater sampling of the nine monitoring wells. *Gallardo & Associates, Inc.* submitted a report entitled **2002 First Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California**, dated April 30, 2002.

On June 5, 2002, *Gallardo & Associates, Inc.* collected groundwater samples from nine monitoring wells. *Gallardo & Associates, Inc.* concluded that the analytical results for wells MW-1 through MW-9 revealed no significant changes in the concentration amounts of petroleum fuel hydrocarbons in the groundwater for the quarter with the exception of well MW-3, which continued to reveal decreasing concentrations of TBA, TPH-g and Benzene. Groundwater flow was to the west-southwest with an average hydraulic gradient of approximately 0.02 ft/ft. *Gallardo & Associates, Inc.* recommended additional episodes of quarterly groundwater sampling of the nine monitoring wells. *Gallardo & Associates, Inc.* submitted a report entitled **2002 Second Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California**, dated June 20, 2002.

On November 22, 2002, *Gallardo & Associates, Inc.* collected groundwater samples from nine monitoring wells. *Gallardo & Associates, Inc.* concluded that the analytical results for wells MW-1 through MW-9 revealed no significant changes in the concentration amounts of petroleum fuel hydrocarbons in the groundwater for the quarter with the exception of well MW-3, which continued to reveal decreasing concentrations of TBA, TPH-g, and Benzene concentrations. Groundwater flow was again to the west-southwest with an average hydraulic gradient of approximately 0.08 ft/ft. *Gallardo & Associates, Inc.* recommended additional episodes of quarterly groundwater sampling of the nine monitoring wells. *Gallardo & Associates, Inc.* submitted a report entitled **2002 Third Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California**, dated September 15, 2002.

Gallardo & Associates, Inc. submitted a report entitled **2002 Fourth Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California**, dated January 30, 2003.

Gallardo & Associates, Inc. submitted a report entitled **2003 First Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California**, dated March 5, 2003.

Gallardo & Associates, Inc. submitted a report entitled **2003 Second Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California**, dated July 2, 2003.

Gallardo & Associates, Inc. submitted a report entitled **2003 Third Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California**, dated September 5, 2003.

Gallardo & Associates, Inc. submitted a report entitled **2003 Fourth Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California**, dated January 25, 2004.

Gallardo & Associates, Inc. submitted a report entitled **2004 First Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California**, dated February 15, 2004.

Gallardo & Associates, Inc. submitted a report entitled **2004 Second Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California**, dated June 19, 2004.

Gallardo & Associates, Inc. submitted a report entitled **2004 Third Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California**, dated September 20, 2004.

Gallardo & Associates, Inc. submitted a report entitled **2004 Fourth Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California**, dated November 6, 2004.

Gallardo & Associates, Inc. submitted a report entitled **2005 First Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California**, dated May 15, 2005.

Gallardo & Associates, Inc. submitted a report entitled **2005 Fourth Quarter Groundwater Sampling Results for Seven Groundwater Monitoring Wells at 3880 Gravenstein Highway in Sebastopol, California**, dated March 1, 2005.

In June 2005, *Gallardo & Associates, Inc.* advanced three deep exploratory soil borings to an approximate depth of between 45 and 51 ½ feet below grade surface (bgs). The three borings were converted into two-inch diameter, 45-foot deep groundwater monitoring wells. *Based on the data collected during this investigation, Gallardo & Associates, Inc. concluded the following: an impacted soil zone was detected beneath exploratory soil boring/groundwater monitoring well DW-1 between a depth of one to 13 feet bgs. The impacted soil was detected near the former UST tank cavity located in front of the existing building. It appeared that both the vertical and lateral*

*extent of the impacted soil had been defined and was located between wells MW-2 and MW-3, up to the end of the northeast corner of the building. It was noted that if this area was to be excavated, it would likely remediate the soil plume. The perched water table had been defined once again and was determined to be flowing through the site from an upgradient direction located northeast of the site and flows through the building in a southern direction. However, it appeared to be seasonal and did not appear to pose a threat to the area during the summer and fall seasons. However, during the winter and spring, it appeared to flow through the impacted shallow soil area located at the front of the building. The perched zone detected during the investigation ranged in thickness from approximately one to two feet. The vertical extent of the groundwater plume may not have been detected during the investigation and appeared to extend beyond a depth of 51 feet bgs. The impact extended into the bedrock which consisted of a highly weathered and fractured Sandstone. However, the lateral extent of the lower water zone impact appeared to be confined to the area around well DW-1. The lower water zone appeared to be under a semi-confined state and may not be completely confined and could be in contact with the upper water table zone. Further evaluation of this premise was recommended. **Gallardo & Associates, Inc.** recommended the excavation of the shallow and deeper impacted soil from the area between wells MW-2 and MW-3, and along the front up to the northeast corner of the August 18 existing building. Excavation of the impacted soil located along the front of the building was suggested to be limited to a depth of approximately nine feet bgs, (former UST cavity). Removal of monitoring well MW-3 was suggested during soil removal and would then be replaced once the shallow impacted soil had been removed. **Gallardo & Associates, Inc.** submitted a report entitled **Deep Well Groundwater Monitoring Well Installation Report for 3880 Gravenstein Highway in Sebastopol, California**, dated September 22, 2005.*

1.3 Site Conceptual Model

1.3.1 Soil Model

The site soils consist of brown to greyish brown sands to an approximate depth of between three and seven feet bgs. The underlying layer consists of a yellow-brown clayey sand containing small seams of sandy clay, however, the seams are consistent and appeared to be connected to a three-foot thick bed of sandy clay detected beneath well MW-7. The bottom most bed consists of a yellow-brown clayey sand to brown sand to a depth of approximately 21 feet bgs. No petroleum odor or discoloration were detected in the encountered soil profile, however, trace amounts of 1,2-Dichloroethane (DCA) were detected in the groundwater sample collected from well MW-6 located downgradient of the former UST cavity. A petroleum odor was detected from between approximately four to eight feet bgs in borings GA-1 through GA-4 located towards the front of the site property. ***The highest impacted soil concentrations detected at the site were, (TPH-g @ 13,000 ppm and benzene @ 27 ppm) located between a depth of approximately 6 to 6 ½ feet bgs. Based on the recent deep well site evaluation, it would appear that both the vertical and lateral extent of the impacted soil has been defined and now appears to be located between wells MW-2 and MW-3, up to the end of the northeast corner of the building. If this area is excavated it is likely that the soil plume can be remediated quickly.***

1.3.2 Groundwater Model

Depending on the season, shallow groundwater beneath the site is generally encountered at a depth

of between approximately 1 ½ and eight feet bgs. The site contains nine groundwater monitoring wells, one drilled to approximately 14 ½, four drilled to a depth of approximately 20 feet bgs, three to 25 feet bgs, and one to 35 feet bgs. Based on the water measurements collected over the years from all of the existing groundwater monitoring wells located at the site property and boring cross sections, groundwater beneath the site appears to be in a confined to semi-confined state. A perched water zone was also detected at a depth of approximately 1 ½ feet bgs and ending at a depth of between 3 ½ feet to five feet bgs. The perched water zone was also detected during the decommissioning of well MW-3 and had a strong gasoline odor when encountered. The perched water zone appears to have been impacted by petroleum fuel hydrocarbons and needs to be defined and sampled. In addition, no deep water borings (> 50 feet bgs) have been advanced on the site. *The groundwater has been impacted by concentrations of TPH-g, BTEX, and the Fuel Oxygenate TBA. The highest concentrations detected at the site were TPH-g @ 8,800 ppb, Benzene @ 260 ppb, and TBA @ 370 ppb. In addition, the Chlorinated Solvent 1,2 DCA was detected at the site (14 ppb). The present concentrations are as follows: TPH-g @ 640 ppb, benzene @ 2.7 ppb, and TBA @ 85 ppb, 1,2 DCA @ 12 ppb. The horizontal extent of the impacted groundwater has been defined along with the perched water table, which flows through the site from an upgradient direction located northeast of the site and flows through the building in a southern direction. However, it appears to be seasonal and does not appear to pose a threat to the area during the summer and fall seasons. However, during the winter and spring, it appears to flow through the impacted shallow soil area located at the front of the building. The perched zone ranges in thickness from approximately one to two feet. The vertical extent of the groundwater plume may not have been detected during the most recent investigation and appears to extend beyond a depth of 51 feet bgs. The impact extends into the bedrock which consists of a highly weathered and fractured Sandstone. However, the lateral extent of the lower water zone impact appears to be confined to the area around well DW-1. The lower water zone appears to be under a semi-confined state, meaning that the water-bearing formation may not be completely confined and may be in contact with the upper water table zone. Further evaluation of this premise must be conducted in order to prove this evaluation.*

2.0 SITE WORK

On December 21, 1998 *Gallardo & Associates, Inc.* arrived at the site property and observed the tank removal contractor, SR Chain Environmental, a certified environmental contractor excavate and expose the 550-gallon waste oil tank. The UST was washed and cleaned until the Lower Explosive Limit, (LEL) was at 0 % and the O₂ level was at 20.6 %. The tank was left in that state until the next day, (12/22/98) when it was pulled out of the ground and delivered to West Coast Scrape Metal, Inc. In Windsor, California. Once the tank was removed, sub-excavation of the tank cavity walls and bottom were performed. The final tank cavity excavation was approximately ten feet in length by seven feet in width by 6 ½ feet in depth. Approximately 16 cubic yards of soil from the tank cavity was placed on and covered with 6-mil visquene and stockpiled on-site for later disposal by the client or client's representative. The excavation was backfilled to the ground surface with clean imported baserock.

3.0 SUMMARY OF ANALYTICAL RESULTS

Soil conformation samples of the tank cavity walls and bottom were collected for analysis of the following: **TPH-d**, **TPH-g**, and **BTEX**. One groundwater "*grab*" was also collected and analyzed for TPH-d. The samples were collected on December 22, 1998.

Soil analytical reports are included in **Appendix B**.

3.1 Soil Analytical Results

The laboratory results for the December 22, 1998 soil samples collected from the former tank cavity are summarized in **Table 1**.

TABLE 1
Former Tank Pit Soil Results for 3880 Gravenstein Highway in Sebastopol, California

SAMPLE NUMBER	SAMPLE DEPTH (Feet)	TPH-d mg/kg	TPH-g mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Xylenes mg/kg
TPB-4	6 ½	1.4	< 1.0	< 0.005	< 0.005	< 0.005	< 0.005
TPWW-3	5	36	25	0.014	0.056	0.15	0.49
TPSW	5 ½	160	680	ND < 0.2	3.0	3.6	22
TPNW-2	2	140	370	0.19	1.0	3.3	17
TPB	4	290	510	ND < 0.05	3.1	5.5	24
SP-1	Center	610	19	< 0.005	0.022	0.11	0.45
#California Department of Health Services primary maximum contamination level for drinking water		None Listed	None Listed	None Listed	None Listed	None Listed	None Listed

TPB = Tank Pit Bottom

TPWW = Tank Pit West Wall

TPSW = Tank Pit South Wall

TPNW = Tank Pit North Wall

SP = Stock pile

3.2 Groundwater Analytical Results

The laboratory results for the December 22, 1998 groundwater “*grab*” sample are summarized in **Table 2**.

TABLE 2
Groundwater sampling results for
3880 Gravenstein Highway in Sebastopol, California

BORING NUMBER	SAMPLE DATE	THP-d ug/L	TPH-g ug/L	Benzene ug/L	Toluene ug/L	Ethyl Benzene ug/L	Xylenes ug/L
TP-1W	12/22/98	64,000	NT	NT	NT	NT	NT
*California Department of Health Services primary maximum contamination level for drinking water.		None Listed	None Listed	1.0	150	300	1,750

Drinking Water Standards and Health Advisories Table, EPA August, 1995. California MCL's. NT = Not Tested

4.0 CONCLUSIONS

Based on the accumulated data and observations made during the tank removal, *Gallardo & Associates, Inc.* concludes the following:

- The waste oil tank was successfully removed from the ground and delivered to a certified scrap-metal facility for disposal.
- The impacted soil was sub-excavated and removed from the ground. The tank pit bottom conformation sample results for TPH-g and BTEX revealed concentrations below the laboratory reporting limits, (non-detect). However, a very slight detection of TPH-d, @ 1.4 ppm was detected.
- Impacted groundwater was detected within the tank cavity.

5.0 REPORT DISTRIBUTION

Gallardo & Associates, Inc. recommends that this report be distributed to the following agencies:

- ***Sonoma County Environmental Health Division***
475 Aviation Blvd., Suite 220
Santa Rosa, CA 95403
Attention: ***Peggy Carr***

6.0 LIMITATIONS

This report has been prepared in accordance with generally accepted environmental, geological and engineering practices. *Gallardo & Associates, Inc.* makes no warranty, either expressed or implied, as to the professional advice presented herein. The analysis, and conclusions contained in this Tank Removal report are based upon site conditions as they existed at the time of the investigation and they are subject to change. The conclusions presented in this report are professional opinions based

solely upon past and present laboratory analytical results, visual observations of the site and vicinity, and interpretation of available information as described in this report. Any use or reuse of this document or its findings, conclusions or recommendations presented herein is at the sole risk of said user.

7.0 REFERENCES

Soil and Groundwater Investigation 3880 Gravenstein Highway South Sebastopol, California by PES Environmental, dated August 25, 1993.

1998 First Quarterly Groundwater Monitoring Report, by *Gallardo & Associates*, dated January 30, 1998.

Workplan for a Limited Soil and Groundwater Investigation, by *Gallardo & Associates*, dated April 15, 1998.

Monitoring Well Installation Report at 3880 Gravenstein Highway in Sebastopol, California, by *Gallardo & Associates, Inc.* dated January 19, 1999.

1999 Second Quarterly Groundwater Monitoring Report, by *Gallardo & Associates, Inc.*, dated July 30, 1999.

2000 Second Quarterly Groundwater Monitoring Report, by *Gallardo & Associates, Inc.*, dated October 20, 2000.

2000 Third Quarterly Groundwater Monitoring Report, by *Gallardo & Associates, Inc.*, dated October 28, 2000.

2000 Fourth Quarterly Groundwater Monitoring Report, by *Gallardo & Associates, Inc.*, dated March 20, 2001.

2001 First Quarterly Groundwater Monitoring Report, by *Gallardo & Associates, Inc.*, dated May 28, 2001.

2001 Second Quarterly Groundwater Monitoring Report, by *Gallardo & Associates, Inc.*, dated June 20, 2001.

Sensitive Receptor Survey for the Minnie Corbit Site Located At:3880 Gravenstein Highway, Sebastopol, California. by *Gallardo & Associates, Inc.*, dated September 1, 2001.

2001 Third Quarterly Groundwater Monitoring Report, by *Gallardo & Associates, Inc.*, dated September 17, 2001.

2001 Fourth Quarterly Groundwater Monitoring Report, by *Gallardo & Associates, Inc.*, dated November 29, 2001.

2002 First Quarterly Groundwater Monitoring Report, by *Gallardo & Associates, Inc.*, dated April 30, 2002.

2002 Second Quarterly Groundwater Monitoring Report, by *Gallardo & Associates, Inc.*, dated June 20, 2002.

2002 Third Quarterly Groundwater Monitoring Report, by *Gallardo & Associates, Inc.*, dated September 15, 2002

2002 Fourth Quarterly Groundwater Monitoring Report, by *Gallardo & Associates, Inc.*, dated January 30, 2003.

2003 First Quarterly Groundwater Monitoring Report, by *Gallardo & Associates, Inc.*, dated March 5, 2003.

2003 Second Quarterly Groundwater Monitoring Report, by *Gallardo & Associates, Inc.*, dated September 5, 2003.

2003 Third Quarterly Groundwater Monitoring Report by *Gallardo & Associates, Inc.*, dated September 5, 2003.

2003 Fourth Quarterly Groundwater Monitoring Report by *Gallardo & Associates, Inc.*, dated January 25, 2004.

2004 First Quarterly Groundwater Monitoring Report by *Gallardo & Associates, Inc.*, dated February 15, 2004.

2004 Second Quarterly Groundwater Monitoring Report by *Gallardo & Associates, Inc.*, dated June 19, 2004.

2004 Third Quarterly Groundwater Monitoring Report by *Gallardo & Associates, Inc.*, dated September 20, 2004.

2004 Fourth Quarterly Groundwater Monitoring Report by *Gallardo & Associates, Inc.*, dated November 6, 2004.

2005 First Quarterly Groundwater Monitoring Report by *Gallardo & Associates, Inc.*, dated May 15, 2005.

2005 Second Quarterly Groundwater Monitoring Report by *Gallardo & Associates, Inc.*, dated September 17, 2005.

2005 Third Quarterly Groundwater Monitoring Report by *Gallardo & Associates, Inc.*, dated September 17, 2005.

2005 Fourth Quarterly Groundwater Monitoring Report by *Gallardo & Associates, Inc.*, dated March 29, 2006.

7.1 Geological References

Geology for Planning in Sonoma County, Special Report 120 , by *California Division of Mines and Geology*, 1980.


Geologic Map of the Santa Rosa Quadrangle, Bortugno, Map No. 2A, 1982 by *D.L. Wagner and E.J. Bortugno*, 1982.

Bulletin No. 118 California's Ground Water, State of California. *Department of Water Resources*, September 1975.

Bulletin 118-80, Ground Water Basins in California, State of California, *Department of Water Resources*, January 1980.

APPENDIX A

Laboratory Results (December 22, 1998)

 McCAMPBELL ANALYTICAL INC.	110 Second Avenue South, #D7, Pacheco, CA 94553-5560 Telephone : 925-798-1620 Fax : 925-798-1622 http://www.mcccampbell.com E-mail: main@mcccampbell.com
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Gallardo & Associates 9417 Kensington Court Windsor, CA 95492	Client Project ID: Minnie Corbit	Date Sampled: 12/22/98
		Date Received: 12/23/98
	Client Contact: Rafael Gallardo	Date Extracted: 12/24/98
	Client P.O:	Date Analyzed: 12/26-12/27/98

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*
 EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g) ⁺	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	% Recovery Surrogate
00748	TPB-4@6½	S	ND	ND	ND	ND	ND	ND	98
00749	TPWW-3@5	S	25,b	ND	0.014	0.056	0.15	0.49	103
00750	TPSW @5 ½	S	680,b	ND<2	ND<0.2	3.0	3.6	22	101
00751	TPNW-2	S	370,b,j	ND<0.7	0.19	1.0	3.3	17	---
00752	TPB@4	S	510,b,j	ND<1	ND<0.05	3.1	5.5	24	101
00754	SP-1	S	19,b,j	ND	ND	0.022	0.11	0.45	94
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	5.0	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/L

" cluttered chromatogram; sample peak coelutes with surrogate peak

*The following descriptions of the TPH chromatogram are cursory in nature and McC Campbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.

DHS Certification No. 1644

Edward Hamilton, Lab Director



McCAMPBELL ANALYTICAL INC.

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Gallardo & Associates 9417 Kensington Court Windsor, CA 95492	Client Project ID: Minnie Corbit	Date Sampled: 12/22/98
		Date Received: 12/23/98
	Client Contact: Rafael Gallardo	Date Extracted: 12/23-12/24/98
	Client P.O:	Date Analyzed: 12/24-12/29/98

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel *

EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

Lab ID	Client ID	Matrix	TPH(d)*	% Recovery Surrogate
00748	TPB-4@6½	S	1.4,d	110
00749	TPWW-3@5	S	36,d	110
00750	TPSW @5 ½	S	160,d	108
00751	TPNW-2	S	140,d	108
00752	TPB@4	S	290,d,g	109
00753	TP-1 W	W	64,000,a	106
00754	SP-1	S	390,a	107
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W		50 ug/L	
	S		1.0 mg/kg	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP / STLC / SPLP extracts in ug/L

* cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

*The following descriptions of the TPH chromatogram are cursory in nature and McC Campbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant; d) gasoline range compounds are significant; e) medium boiling point pattern that does not match diesel (?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment.

DHS Certification No. 1644

____ Edward Hamilton, Lab Director